

TITLE: NEW RECEPTOR AND RELATED PRODUCTS AND METHODS  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/955,572

1/6

ATGTCCATGA ACTGCTGAGT GGATAAACAG CACGGGATAT CTCTGTCTAA  
AGGAATATTA CTACACCAGG AAAAGGACAC ATTCGACAAC AGGAAAGGAG  
CCTGTCACAG AAAACCACAG TGTCCTGTGC ATGTGACATT TCGCC

-96  
-46  
-1

ATG GGA AAC AAC TGT TAC AAC GTG GTG GTC ATT GTG CTG CTG CTA  
Met Gly Asn Asn Cys Tyr Asn Val Val Val Ile Val Leu Leu Leu

45

G TG GGC TGT GAG AAG GTG GGA GCC GTG CAG AAC TCC TGT GAT AAC  
Val Gly Cys Glu Lys Val Gly Ala Val Gln Asn Ser Cys Asp Asn

90

TGT CAG CCT GGT ACT TTC TGC AGA AAA TAC AAT CCA GTC TGC AAG  
Cys Gln Pro Gly Thr Phe Cys Arg Lys Tyr Asn Pro Val Cys Lys  
H4-1BB FI

135

AGC TGC CCT CCA AGT ACC TTC TCC AGC ATA GGT GGA CAG CCG AAC  
Ser Cys Pro Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn  
H4-1BB FII

180

TGT AAC ATC TGC AGA GTG TGT GCA GGC TAT TTC AGG TTC AAG AAG  
Cys Asn Ile Cys Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys

225

TTT TGC TCC TCT ACC CAC AAC GCG GAG TGT GAG TGC ATT GAA GGA  
Phe Cys Ser Ser Thr His Asn Ala Glu Cys Glu Cys Ile Glu Gly

270

TTC CAT TGC TTG GGG CCA CAG TGC ACC AGA TGT GAA AAG GAC TGC  
Phe His Cys Leu Gly Pro Gln Cys Thr Arg Cys Glu Lys Asp Cys

315

AGG CCT GGC CAG GAG CTA ACG AAG CAG GGT TGC AAA ACC TGT AGC  
Arg Pro Gly Gln Glu Leu Thr Lys Gln Gly Cys Lys Thr Cys Ser  
H4-1BB RI

360

TTG GGA ACA TTT AAT GAC CAG AAC GGT ACT GGC GTC TGT CGA CCC  
Leu Gly Thr Phe Asn Asp Gln Asn Gly Thr Gly Val Cys Arg Pro  
H4-1BB RII

405

TGG ACG AAC TGC TCT CTA GAC GGA AGG TCT GTG CTT AAG ACC GGG  
Trp Thr Asn Cys Ser Leu Asp Gly Arg Ser Val Leu Lys Thr Gly

450

ACC ACG GAG AAG GAC GTG GTG TGT GGA CCC CCT GTG GTG AGC TTC  
Thr Thr Glu Lys Asp Val Val Cys Gly Pro Pro Val Val Ser Phe

495

TCT CCC AGT ACC ACC ATT TCT GTG ACT CCA GAG GGA GGA CCA GGA  
Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu Gly Gly Pro Gly

540

GGG CAC TCC TTG CAG GTC CTT ACC TTG TTC CTG GCG CTG ACA TCG  
Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu Ala Leu Thr Ser

585

GCT TTG CTG CTG GCC CTG ATC TTC ATT ACT CTC CTG TTC TCT GTG  
Ala Leu Leu Leu Ala Leu Ile Phe Ile Thr Leu Leu Phe Ser Val

630

Fig. 1

TITLE: NEW RECEPTOR AND RELATED PRODUCTS AND METHODS  
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CTC AAA TGG ATC AGG AAA AAA TTC CCC CAC ATA TTC AAG CAA CCA 675  
Leu Lys Trp Ile Arg Lys Lys Phe Pro His Ile Phe Lys Gln Pro

TTT AAG AAG ACC ACT GGA GCA GCT CAA GAG GAA GAT GCT TGT AGC 7.20  
Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Glu Asp Ala Cys Ser

TGC CGA TGT CCA CAG GAA GAA GGA GGA GGA GGA GGC TAT GAG 765  
Cys Arg Cys Pro Gln Glu Glu Gly Gly Gly Gly Tyr Glu

CTG TGA 771  
Leu ---

TGTACTATCC TAGGAGATGT GTGGGCCGAA ACCGAGAAGC ACTAGGACCC 821  
CACCATCCTG TGGAACAGCA CAAGCAACCC CACCACCCCTG TTCTTACACA 871  
TCATCCTAGA TGATGTGTGG GCGCGCACCT CATCCAAGTC TCTTCTAACG 921  
CTAACATATT TGTCTTTACC TTTTTAAAT CTTTTTTAA ATTAAATTT 971  
TATGTGTGTG AGTGTGTTGC CTGCCTGTAT GCACACGTGT GTGTGTGTGT 1021  
GTGTGTGACA CTCCTGATGC CTGAGGAGGT CAGAAGACAA AGGGTTGGTT 1071  
CCATAAGAAC TGGAGTTATG GATGGCTGTG AGCCGGNNNG ATAGGTGCGGG 1121  
ACGGAGACCT GTCTTCTTAT TTTAACGTGA CTGTATAATA AAAAAAAAAT 1171  
GATATTCGG GAATTGTAGA GATTGTCTG ACACCCTCT AGTTAATGAT 1221  
CTAAGAGGAA TTGTTGATAC GTAGTATACT GTATATGTGT ATGTATATGT 1271  
ATATGTATAT ATAAGACTCT TTTACTGTCA AAGTCAACCT AGAGTGTCTG 1321  
GTTACCAGGT CAATTTTATT GGACATTTA CGTCACACAC ACACACACAC 1371  
ACACACACAC ACGTTTATAC TACGTACTGT TATCGGTATT CTACGTCTA 1421  
TAATGGGATA GGGTAAAAGG AAACCAAAGA GTGAGTGATA TTATTGTGGA 1471  
GGTGACAGAC TACCCCTCT GGGTACGTAG GGACAGACCT CCTTCGGACT 1521  
GTCTAAAACT CCCCTTAGAA GTCTCGTCAA GTTCCCGGAC GAAGAGGACA 1571  
GAGGAGACAC AGTCCGAAAA GTTATTTTC CGGCAAATCC TTTCCCTGTT 1621  
TCGTGACACT CCACCCCTTG TGGACACTTG AGTGTATCC TTGCGCCGG 1671  
AGGTCAAGGTG GTACCCGTCT GTAGGGCGG GGAGACAGAG CCGCGGGGGA 1721  
GCTACGAGAA TCGACTCACA GGGCGCCCCG GGCTTCGCAA ATGAAACTTT 1771  
TTAATCTCA CAAGTTTCGT CCGGGCTCGG CGGACCTATG GCGTCGATCC 1821  
TTATTACCTT ATCCTGGCGC CAAGATAAAA CAACCAAAAG CCTTGACTCC 1871  
GGTACTAATT CTCCCTGCCG GCCCCCCTAA GCATAACGCG GCGATCTCCA 1921  
CTTAAGAAC CTGGCCGGT TCTGCCTGGT CTCGCTTTCG TAAACGGTT 1971  
TTACAAAAGT AATTAGTCT TGCTTTCAGC CTCCAAGCTT CTGCTAGTCT 2021  
ATGGCAGCAT CAAGGCTGGT ATTTGCTACG GCTGACCGCT ACGCCGCCGC 2071  
AATAAGGGTA CTGGGCGGCC CGTCGAAGGC CCTTTGGTTT CAGAAACCCA 2121  
AGGCCCCCT CATACCAACG TTTCGACTTT GATTCTTGCC GGTACGTGGT 2171  
GGTGGGTGCC TTAGCTCTT CTCGATAGTT AGAC 2205

Fig. 1 Cont'd



human homologue of mouse 4-1bb

h4-1bb Length 838

1	AATCAGCTT	GCTAGTATCA	TACCTGTGCC	AGATTCATC	ATGGGAAACA
51	GCTGTTACAA	CATAGTAGCC	ACTCTGTTGC	TGGTCCTCAA	CTTGAGAGG
101	ACAAGATCAT	TGCAGGATCC	TTGTAGTAAC	TGCCAGCTG	GTACATTCTG
151	TGATAATAAC	AGGAATCAGA	TTTGCAGTCC	CTGTCCTCCA	AATAGTTCT
201	CCAGCGCAGG	TGGACAAAGG	ACCTGTGACA	TATGCAGGCA	GTGTAAAGGT
251	GTTCAGGA	CCAGGAAGGA	GTGTCCTCC	ACCAGCAATG	CAGAGTGTGA
301	CTGCACTCCA	GGGTTCACT	GCCTGGGGC	AGGATGCAGC	ATGTGTGAAC
351	AGGATTGTAA	ACAAGGTCAA	GAACGTACAA	AAAAAGGTTG	TAAAGACTGT
401	TGCTTTGGGA	CATTTAACGA	TCAGAAACGT	GGCATCTGTC	GACCCTGGAC
451	AAACTGTTCT	TTGGATGGAA	AGTCGTGCT	TGTGAATGGG	ACGAAGGAGA
501	GGGACGTGGT	CTGTGGACCA	TCTCCAGCTG	ACCTCTCTCC	GGGAGCATCC
551	TCTGTGACCC	CGCCTGCC	TGCGAGAGAG	CCAGGACACT	CTCCGCAGAT
601	CATCTCCTTC	TTTCTTGC	TGACGTCGAC	TGCGTTGCTC	TTCCTGCTGT
651	TCTTCCTCAC	GCTCCGTTTC	TCTGTTGTTA	AACGGGGCAG	AAAGAAACTC
701	CTGTATATAT	TCAAACAAACC	ATTTATGAGA	CCAGTACAAA	CTACTCAAGA
751	GGAAGATGGC	TGTAGCTGCC	GATTCCAGA	AGAAGAAGAA	GGAGGATGTG
801	AACTGTGAAA	TGGAAGTCAA	TAGGGCTGTT	GGGACTTT	

Fig. 2A

1	MGNSCYNIVA	TLLLVLNFER	TRSLQDPCSN	CPAGTFCDNN	RNQICSPCPP
51	NSFSSAGGQR	TCDICRQCKG	VFRTRKECSS	TSNAECDCTP	GFHCLGAGCS
101	MCEQDCKQGQ	ELTKKGCKDC	CFGTFNDQKR	GICRPWTNCS	LDGKSVLVNG
151	TKERDVVCGP	SPADLSPGAS	SVTPPAPARE	PGHSPQIISF	FLALTSTALL
201	FLLFFLTLRF	SVVKRGRKKL	LYIFKQPFMR	PVQTTQEEDG	CSCRFPEEEE
251	GGCEL				

Fig. 2B

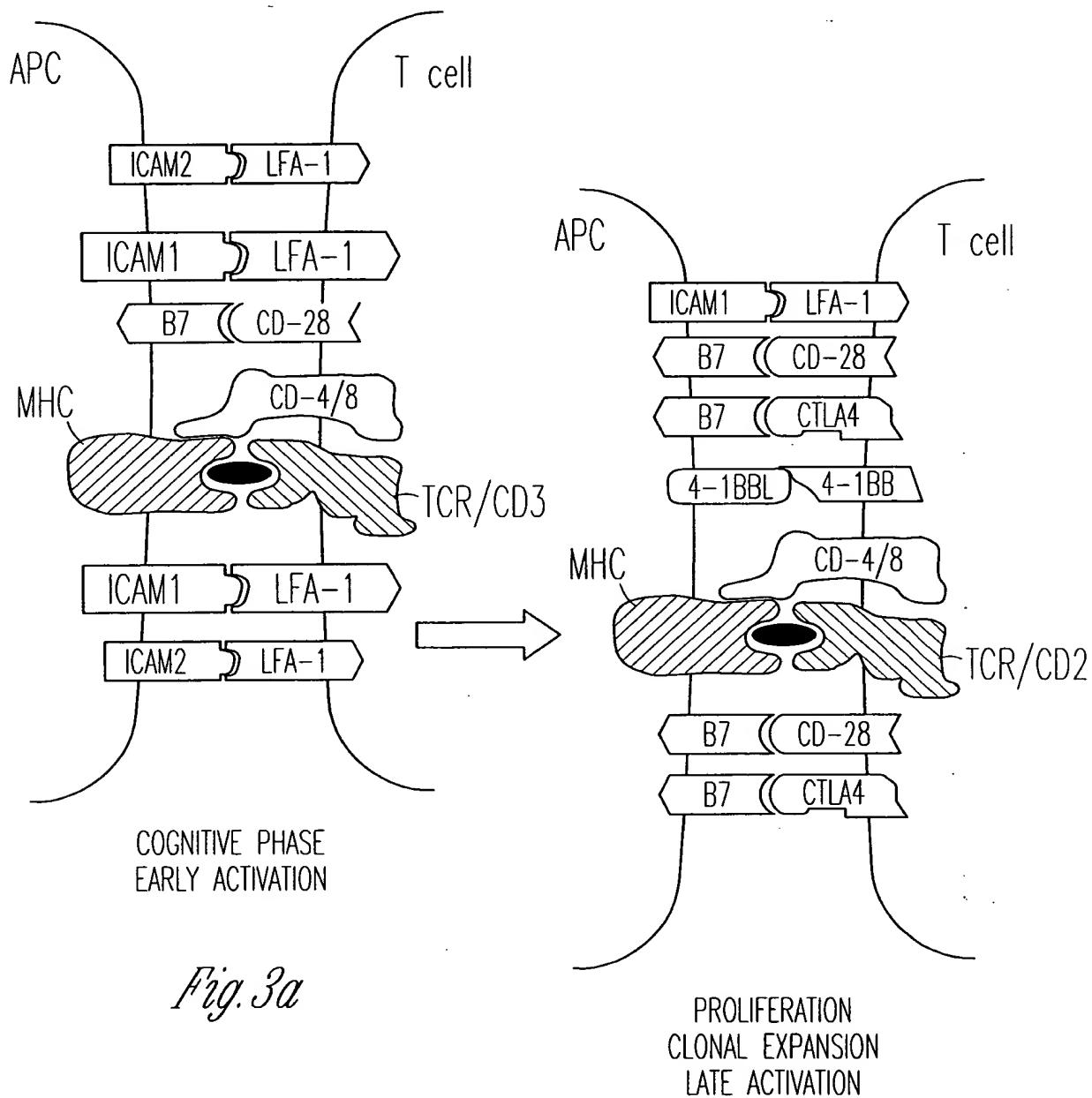
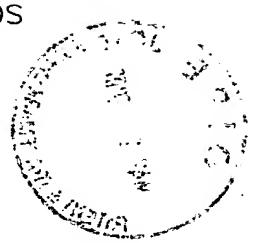


Fig. 3a

PROLIFERATION  
CLONAL EXPANSION  
LATE ACTIVATION

Fig. 3b



NORMAL T CELL ACTIVATION PATHWAY

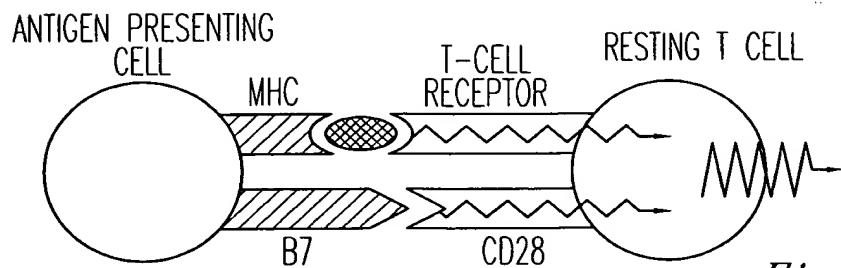


Fig. 4a

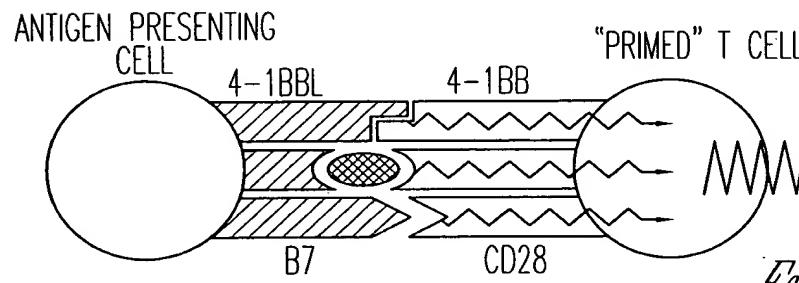


Fig. 4b

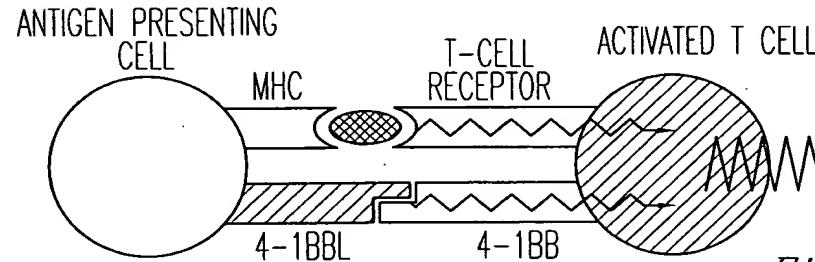


Fig. 4c

## BLOCKING STEPS IN T-CELL ACTIVATION PATHWAY

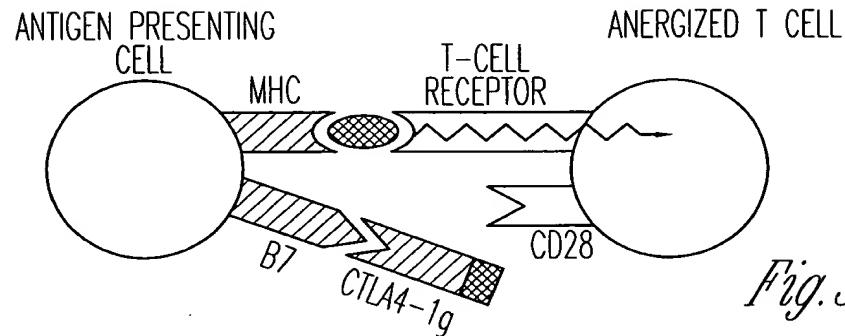


Fig. 5a

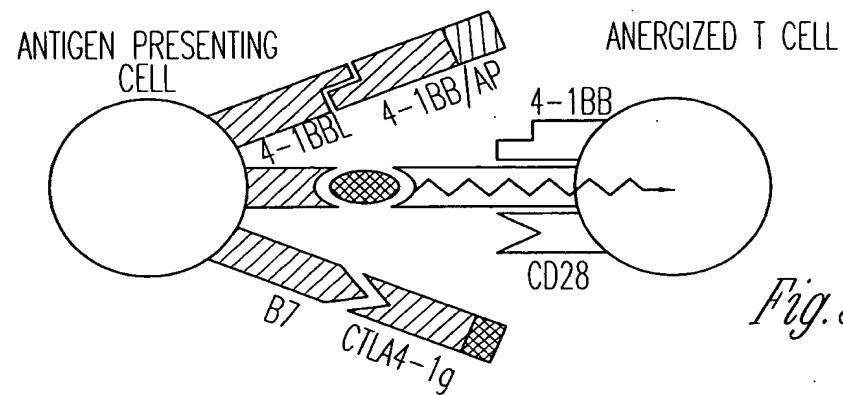


Fig. 5b

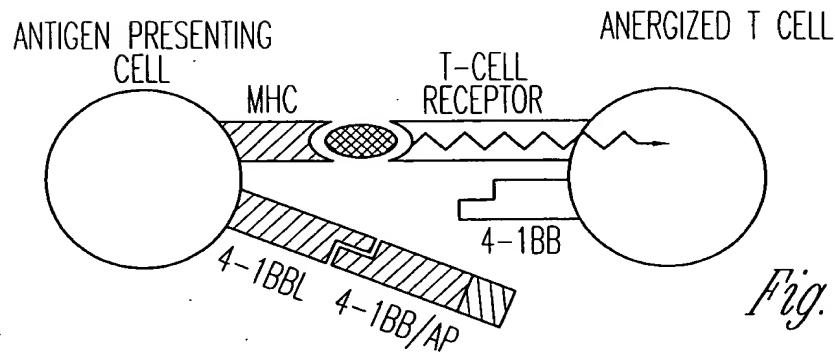


Fig. 5c

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